

College dormitories, and the six off-campus fraternities had given up their houses at the beginning of the war. Moreover, very few apartments of any kind were available in Schenectady. The College considered buying a large building near the campus, but found that it would be prohibitively expensive to renovate, and that the use might be barred by the zoning laws.

The only solution was to build on the campus; several sites (immediately north of Butterfield Hall, in the Pasture, and at the corner of Nott Street and Lenox Road) were considered and rejected before acting president BENJAMIN WHITAKER and Comptroller ANTHONY HOADLEY chose the 3.2 acre plot on Nott Street, east of the house at 642 and surrounding the Delta Phi fraternity house.

The Border Construction Co. erected the first sixty-one units, and Anthony P. Miller, Inc., of Atlantic City, New Jersey, the remainder. The Federal Public Housing Authority paid for the construction, while the College and the State of New York shared the cost of preparing the site, building roads and sidewalks, and installing utilities. The first twelve families moved in on November 1, 1946, and a total of thirty-six apartments were occupied in the fall. Twenty-five more were occupied at the beginning of April 1947.

There were eventually seventy-eight apartments—of which forty-two were four-room units, and the rest three-room—occupied in toto by 325 adults and about 60 children below school age.

Though officially “Reconversion Housing Project for Veterans (F.P.H.A. no. N.Y. V-30195),” the project was dubbed “Dutchmen’s Village” by the trustees on November 2, 1946—an apt name in that many of the residents saw themselves as a community apart. Although the apartments had all the predictable defects of cheap, temporary housing and the grounds were often muddy, spirits among both the students and the instructors were generally high.

The dormitories were made a little more village-like in 1949 when the Carpenter’s and Painters Union, with help from the Chamber of Commerce, donated most of the labor to erect a fence along Nott Street and between some of the buildings. A few years later, however, the College was eager to tear down the rapidly deteriorating buildings as soon as possible rather than waste money trying to maintain them. The first seven structures were razed in October of 1953 to make way for the Memorial Field House; more were demolished in the summer of 1954, and the last in the summer of 1955.

To accommodate single students during this period, the College also built several temporary dormitories in the Pasture (see VETERANS’ HOUSING).

Economics Department. Until near the end of the nineteenth century, what we call economics was generally known, at Union and elsewhere, as “political

economy.” (“Political” in that it dealt with economic subjects primarily from a governmental perspective, it is consequently also considered an ancestor of the field of POLITICAL SCIENCE.)

Because course-level records of Union’s first quarter century are sketchy, it is impossible to ascertain the extent to which political economy may have been taught during that period. By 1824 the standard course of study included lectures on political economy; under the revised curriculum of 1828, these were joined by recitation sections, and the subject became a required course for third-term juniors. The Rev. THOMAS REED ’26 began teaching it in 1831 as Adjunct Professor of Political Economy and Intellectual Philosophy. That same year, the Rev. ALONZO POTTER ’18, formerly Professor of Mathematics and Natural Philosophy, returned to the faculty as Professor of Rhetoric and Moral Philosophy, serving until 1845; though not known to have taught the subject, Potter was a genuine political economist. An excerpt from his 1840 book, *Political economy*, was being used in the department’s History of Economic Thought course in 1990.

The text Union used by 1840, French economist Jean-Baptiste Say’s *Political economy*, establishes the course recognizably as economics at a state-of-the-art level. A clear expositor of what we now call classical economics, Say is famous for “Say’s Law,” arguably overturned by the Keynesian revolution but still well-known. Lectures on political economy moved to the senior year, and all students also took moral philosophy, which was integrally related in its intellectual development to the later discipline of political economy (see PHILOSOPHY).

From 1840, the catalogues began to list “departments” (which were not departments in the modern sense, but courses of study; see DEPARTMENTS, DIVISIONS AND CENTERS); among these was a “Department of Moral and Political Science.” All students were required to study “Say’s *Political economy*, with lectures by the professor and dissertations by the pupils,” though subsequent years saw minor variations between the requirements for the scientific and classical students. An 1852 listing of departments “organized or about to be organized” grouped political economy with logic, but the political economy requirement remained unchanged. In 1855 and 1856, the political economists evidently lost a bit of autonomy but discovered their voices: the required course in “Political Economy, composition and declamation” was listed under “Intellectual, Moral, and Political Science.”

It is not always clear who taught political economy. Even before Reed shifted to Latin in 1849, his lectures had apparently been assigned for a few years (1838–43) to the German-born professor of political economy and German literature, JOHANN LUDWIG

TELLKAMPF, who had previously lectured on political economy at the University of Göttingen. Although primarily interested in law, Tellkampf also published articles and later books on money and banking.

Another German, ELIAS PEISSNER, who joined the faculty in 1851 principally to teach languages, soon began lecturing on political economy, although "Lecturer in Political Economy" was not added to his title until 1857. He joined the Union army as a colonel in 1862 and was killed the next year at the Battle of Chancellorsville.

In 1857, a "Department of Political Economy" appeared in the catalogue:

A course of Lectures on this subject are delivered in the Second Term of the Junior Year. They are arranged as follows: Definition and Method; Geographical and Ethnographical Review of the Earth; its distribution among Tribes and Nations, with the origin of National and Private Property; Historical Sketch of Civilization; Elements of Society; Departments of Human Labor, including Government, School, and Church; Development of Money (metal and paper); Value and Price of Labor and Products; Capital and Land; Taxation; Harmony between the different departments of Labor, with its obstructions in different nations; Population and Production; Historical Sketch of Modern Industry; Present State of Nations.

In contrast to this ambitious agenda, the reality at Union for the next half century was more modest. Political economy was usually taught but occasionally omitted; the number of recitations in the subject reported to the Regents shows that it had only a minor place in the curriculum. By 1868 the catalogue description merely promised: "In this department it is designed to give the student a sufficient knowledge of the elements of Political Economy to enable him to read and converse on the subject intelligently." Neither of the two new texts adopted during the next decade were by authors of Say's stature.

During this period, accounting made a fleeting appearance in the College's curriculum under curious circumstances. On Union University's establishment in 1873, the Troy Business College was briefly one of its components; probably to cement this relationship, in the spring of that year Union required all seniors to take a term of bookkeeping, taught by the Troy Business College's professor J.R. Carnell.

Although economics generally played a small role in the curriculum, there were periods of evident ambition: in 1885 the Department of Political Economy (still included in "History and Political Economy") set a broad agenda. A standard textbook was to be supplemented by readings in John Stuart Mill, John Elliott Cairnes, and Henry George, all influential economists.

Under the new curriculum adopted in 1897, the course was finally called "Economics." Now included in a Department of History and Sociology and required for all students, including engineers, it met

three hours per week in the first term of the senior year. The course description, acknowledging the existence of multiple schools of economic thought, noted: "Particular attention is given to the subject of the Organization of Industry, to Markets, Prices, Wages, the theory of Demand and Supply, and to Money and Banking."

The emphasis on practical affairs is also evident in the BUTTERFIELD LECTURE COURSE, 1892-97, whose twenty-eight lecturers included, along with politicians, generals, and diplomats, eminent individuals discussing labor, banking and finance, wealth and its uses, and protective tariffs.

In 1910 economics and sociology split from history to form a new department with a decidedly economic bent, including two separate courses in elements of economics: a one-term course required for most engineers, and a full year course required of all other students. Interestingly, the department's other economics course was Economic History, treating "the economic history of England from the tenth century to the present time, and the leading events in the economic history of the United States." In 1912/13 the curriculum was restructured again to include some financial history.

While Union clearly was no hotbed of innovative thinking in the field, the discipline was not necessarily marginal or somnolent at the College. Rather, the Union experience was probably a result of several broader developments.

First, much of economic theory was being evaluated in England and on the continent. In 1890 Alfred Marshall published *Principles of economics*, pulling together substantial strands of classical theory into neo-classical economics. Although they participated in some of the theoretical debates, most American political economists were more pragmatically oriented.

Second, the study of economics was inextricably linked not only with morality and religion but also with philosophy and logic. In England, with its relatively insular academic community, the evolution of these discussions was also strongly linked, as J.M. Keynes' biographer Robert Skidelsky points out, with the loss of religious belief on the part of the English intelligentsia. Colleges in the United States were much less likely to be caught up in this kind of debate, and, indeed, intense social activism often had a religious basis even among the intelligentsia, at Union and elsewhere.

Third, and perhaps most important, economic analysis in this country was closely connected, intellectually and practically, with policy issues studied also by historians, political scientists, and sociologists. This tendency is reflected in the *Johns Hopkins University studies in historical and political science*, launched in 1883. Most of its first monographs were political and historical, but by 1908, although the series title did not

change, the department of political economy joined history and political science in its direction, and it has continued to publish monographs in all three fields, as well as hybrids thereof. Union's social science curriculum suggests that some of that interdisciplinary approach was also at work here, although the College's political economics faculty could not be said to have helped shape the discipline.

In 1918 Union ceased offering sociology for several decades, leaving economics as a separate department with a single professor. In the fall of 1919, at the recommendation of trustee (and General Electric president) EDWIN W. RICE JR., all engineering majors were required to take a term of elementary economics. This requirement continued in one form or another through 1949, and returned in 1957, ending finally with the introduction in 1965 of the Comprehensive Education curriculum.

In his 1925/26 midwinter report, as the College was growing larger and stronger, President Richmond urged, "Certain departments must be strengthened, particularly economics, a subject of great importance, especially in a community like ours." When the College moved in 1927 to enlarge the department, the wording of a *Concordiensis* report suggested that recent economics teaching had left little trace in the institutional memory: "The advent of a department of economics was long expected to take place at Union. For economics has begun to be considered one of the fundamental subjects for study for all college students.... Colleges throughout the country, since 1900, have been led to form departments of economics because of the realization that all ought to know the social structure and organization in which man lives and in which he earns his living."

Leading the "new" department was WILLIAM WHIPPLE BENNETT (PhD Princeton) 1927–63, a specialist in money and banking, and labor relations, who helped enrich the curriculum in the 1930s and 1940s, and served as chair until 1955. During that time, the economics faculty grew from one to five, though not mainly within a department framework. In the Depression year 1934, against a backdrop in all of American higher education of shrinking resources, Union implemented a faculty and curricular reorganization drafted by a committee under economics professor EARL EVERETT CUMMINS. The new structure, intended to save money and yield educational benefits by de-emphasizing departments, reorganized the College's eighteen disciplines into four divisions. Economics became one of the "fields" within the Social Studies Division (which was frequently chaired during the next three decades by economists).

Cummins (PhD Yale), at Union from 1931 until his untimely death in 1938, was a labor economist and the author of a successful textbook, *The labor problem in the United States* (1931; rev. 1935). Bennett's other

significant pre-war appointments were JOSEPH ROTUNDO and BENJAMIN WHITAKER. Rotundo, a 1929 Union College graduate with no advanced degrees, who joined the economics department in 1935, had earlier (1929/30) taught in the English department. Also a labor economist, he became a very popular teacher; like Cummins he died early, in 1953. Whitaker (PhD Yale) 1939–66, hired as Cummins's successor, came to Union after six years in various positions in Connecticut state government, including Budget Director.

After the Second World War, John Prior Lewis '41 (PhD Harvard 1950), perhaps the most distinguished academic economist among Union's graduates or former faculty, served in the economics department for four years (1946–50). He left for Indiana University, and was later appointed to President Kennedy's Council of Economic Advisors and to the Princeton University faculty.

Lewis appears to have gotten along quite well with his faculty colleagues at Union, although, unlike them, he taught the new and "radical" theories of John Maynard Keynes—among the greatest economists of all time—and Paul Samuelson, who later won a Nobel Prize and whose newly-published textbook would eventually dominate the introductory economics book market and strongly influence the teaching of undergraduates for decades. Although Lewis did not know it, long-time College treasurer FRANK BAILEY, upset with what he had heard about Lewis's teaching, dispatched a trusted friend to inspect the department. Bailey concluded that Lewis taught "unsound" economics. Other department members apparently regarded the inspection as unimportant (or even a joke) and it played no role in Lewis's leaving, but Bailey's concern about "left teaching" turned into a troublesome crusade, described in the article about him.

Even after Lewis's departure, the department was an unusually strong one, thanks primarily to the long and fruitful tenures of Bennett and Whitaker. LAWRENCE ABBOTT (PhD Columbia), 1953–68, who replaced Rotundo, later played a significant role as well. All three chaired the department, and Bennett and Whitaker also chaired the Social Studies Division. Bennett served for a decade (1935–45) as part-time Coordinator of Student Activities, while Whitaker served as Union's comptroller (1943–45) and then stepped in, after President Dixon Ryan Fox died in office, as acting president (February 1945–February 1946).

The department's offerings at that time would now be considered an undergraduate business major, including such courses as accounting—which both Whitaker and Bennett taught before the 1947 arrival of HAROLD GARDNER AVERY (PhD Columbia)—corporate finance, marketing, labor and industrial relations, and managerial economics. Like some other

departments, economics had until 1962 a strong board of visitors, including academics and business people. A solid Industrial Administration major launched in 1948 featured a substantial concentration in economics. The department (and indeed the division) appeared to have taken great pride in producing future business executives.

With the exception of Abbott, whose *Quality and competition; an essay in economic theory* (1955) proposed a new theory of competition, Union's faculty appears to have been interested less in specialized theorizing and more in the application of intelligence to real problems. Much later, in *India's political economy* (1995), John Prior Lewis clearly stated his own view: "As a visiting economist, I have always been fascinated by Indian government...in the real world economics has always been political economy." Bennett served during the Second World War as a part-time hearings officer and arbitrator for the War Labor Board; Cummins ran twice for public office (unsuccessfully), Rotundo helped General Electric workers form what became the United Electrical, Radio, and Machine Workers of America, and Whitaker served as a consultant to the New York and several other state governments on tax issues.

Bennett, Avery, Whitaker, and Abbott retired between 1963 and 1968. Although Norman Andrew Mercer (PhD Harvard), 1958–68, and Alfred L. Thimm (PhD New York University)—a member of the department from 1960 to 1969, but occupied with direction of the GRADUATE MANAGEMENT INSTITUTE after 1961—provided some continuity for a few more years, the department's transition during 1968–73 to a new nucleus of faculty can only be called turbulent. The majority of department members did not yet have doctorates, and consequently during this period economics had more instructors and lecturers than senior faculty. Of the seventeen faculty members in residence at some time during those years, only two were full professors.

One reason is easy to identify: demand for faculty rose rapidly beginning in the mid-1960s as the baby boom generation began to attend college in record numbers. Four members of the new generation remained for the balance of their academic careers: Peter Anthony Prosper (PhD Cornell) 1964–99, a specialist in labor economics and industrial relations; Thomas Richard Kershner (PhD Harvard), 1968–98, interested in macroeconomic theory and economic forecasting; E. Dwight Haup (PhD Virginia), who pursued his fields of international finance and monetary theory from 1972 until his untimely death in September 1990, and James M. Kenney (PhD Stanford), a specialist in managerial and environmental economics who arrived in 1972 and is still teaching.

Tension over the degree to which the department should emphasize a pragmatic and often institutional

approach rather than economic theory and quantitative methods peaked, not for the last time, in 1969 when the College hired as department chairman Robert S. Herman '41 (PhD NYU). Herman, who had combined an academic career with long-time service to the New York State division of the budget and other parts of state government, served as chair until 1971 and left the College in 1974.

Kershner's eight-year chairmanship (1973–81) saw the appointment of four more faculty who were still in the department at the end of the period covered by this book: Bruce Reynolds (PhD Michigan), 1974– (economics of China; comparative economic systems); Shelton S. Schmidt (PhD Virginia), 1974– (industrial organization; econometrics, efficiency measurement); J. Douglass Klein (PhD Wisconsin), 1979– (industrial organization, energy economics, efficiency measurement); and Bradley G. Lewis (PhD Chicago), 1979– (financial analysis; economic history). The last department member tenured by 1990, Harold Fried (PhD North Carolina), 1983–, is a specialist in efficiency measurement, international trade, and econometrics.

For tenure-track faculty, Kershner typically sought candidates with undergraduate degrees from small liberal arts colleges and PhDs (in hand or prospective) from highly-ranked universities with high research expectations. This fit a college in which strong teaching was still expected for tenure, a PhD or equivalent was required to remain on the faculty, and scholarship was becoming expected rather than optional, and in which faculty, even at smaller colleges, increasingly identified with their disciplines rather than their institutions.

The new department eventually taught a curriculum revised significantly from the previous one in a much altered college-wide environment. Although women had taught in the department as early as 1972, the first to earn tenure, Therese McCarty (PhD Michigan), a specialist in public finance and the economics of education, did not join the faculty until 1987.

The department required all economics majors to take not only introductory economics but also intermediate courses in microeconomics, macroeconomics, and statistics and to complete a two-term senior thesis project. Perhaps more than most liberal arts college economics departments, Union's faculty emphasized quantitative research, and it was able to find or raise money for improved computers and datasets at an early stage. Accounting was now taught by the Graduate Management Institute rather than in the department, and the elective courses in the curriculum were more typical of those offered in graduate programs, albeit at the undergraduate level.

Still, Union's economics department remained unlike those of many other liberal arts colleges in offering courses in finance, labor and collective bargaining, and managerial economics; requiring a senior project,

usually quantitative, of every major; and offering majors not only in economics but also in managerial economics and industrial economics. Its graduates also typically continued to seek careers in business (especially banking and finance) and the professions, with few of them choosing to do PhD work in economics. Particularly in the 1980s, enrollments increased substantially and the department began to win some recognition for its research output among liberal arts colleges.

Mirroring national trends in the field, the economics faculty's scholarly output was mainly in the form of journal articles or contributions to edited collections, rather than monographs.

The department was also affected by college-wide changes from a semester to a three-term calendar (1966); from Comprehensive Education to a new general education program (1977); and, beginning with the HAROLD MARTIN administration in 1965, by an increased emphasis on published research as well as strong teaching as a condition for earning tenure, promotion, and merit pay raises. The department had an average of fourteen faculty members from 1988 to 1991, compared with a typical size of eight to nine in the 1970s and five to seven in the 1950s and 1960s.

Although there are exceptions, it seems fair to generalize that, compared to peer institutions, Union's department has remained more oriented toward applied than toward theoretical economics. It has produced many successful business executives but relatively few professional economists for a college of Union's size and stature. Among its students and faculty, Alonzo Potter and John Prior Lewis probably earned the highest reputations in the broader intellectual world.

Soon after the department was re-invigorated under Bennett, offices were created for it in Washburn Hall. Economics moved to Bailey Hall in 1935 and to the Social Science Building in 1967.

Department Chairs: 1927–55: William Whipple Bennett; 1955–62: Benjamin Palmer Whitaker; 1962–66: Lawrence Abbott; 1966–68: Norman Andrew Mercer; 1968–69: Alfred L. Thimm (Acting Chair); 1969–71: Robert S. Herman; 1971–73: John Richard McNamara; 1973–81: Thomas R. Kershner; 1981–85: E. Dwight Phaup; 1985–88: Peter A. Prosper Jr.; 1988–91: Shelton S. Schmidt.

—Bradley G. Lewis

Educational Studies Program. Union graduates have of course become teachers at all levels from the College's earliest days. Not only were nineteenth- and early twentieth-century secondary school teachers not required to be licensed, but they also were often entirely without college study. It was also common for college students to take off a term or more in order to earn a little money by teaching grammar school.

Only once before the twentieth century is Union known to have offered its students instruction in pedagogy. Writing to the Board of Regents on the work for 1843, the College reported:

Lectures were also delivered [to the Senior Class] in Normal Instruction, and extra classes were formed in Latin composition and the Greek Tragedies, with special reference to a preparation for teaching. So many graduates engage in this employment, that it is thought important to furnish them with some theoretical and practical instruction in regard to the objects of teaching, the best methods, &c. &c.

This special instruction apparently ceased soon thereafter; no other mention of it has been found.

In response to New York State requirements for a teaching certificate, the College began in the fall of 1929 to offer courses in the History of Education and in Educational Psychology. A year later, courses in Principles of Education and Methods of Teaching were added. Practice teaching in local schools was a part of the program from about 1936.

During the three decades (1928–59) that they were taught by psychology professor FRANKLIN CHILLRUD, the four courses changed somewhat in response to alterations in the state certification requirements. When the state began after the Second World War to require a fifth year of college work for a teaching certificate, Union instituted a Master of Education program, of which the education component was the same four courses. Between 1949 and 1966, thirty-one people earned this degree, some of them through the Evening Division.

Citing the low enrollments, the College closed the Education program four years after Chillrud's retirement, admitting no new students after 1962/63.

Reports in the early 1980s, such as those issued by the National Commission for Excellence in Teacher Education and the Carnegie Task Force on Teaching as a Profession, recommended a broad liberal arts education and strong academic majors as the appropriate background for prospective teachers. At the same time, reports such as *A nation at risk* emphasized the dire state of American education and the need for a national response to the problems of schools. With the growing debate on the quality of teacher preparation, Union faculty and administrators began in the mid-1980s to plan a program to prepare teachers who would not only be effective and creative in the classroom, but who might provide leadership to the profession.

Initial efforts came from Associate Dean of Graduate and Continuing Studies Joan Krejci and Associate Dean of the Faculty Terry Weiner. Surveys of the faculty and studies of programs at similar institutions led eventually to Krejci's application for a grant to support the planning and creation of a program at Union. In 1987, the College received \$97,000 from the Fund for the Improvement of Post-Secondary Education.

Janet McDonald was hired in January 1988 as the program's first director, and Krejci and McDonald began to design the program. Not conceived as a separate department, it drew instead on the College's existing faculty. Fundamental to the design were teams of Union faculty and master secondary school teachers; each team worked for a two-year period with an expert in pedagogy in its field. The teams would eventually design and teach the Curriculum and Methods courses and play key roles in all aspects of the program.

Among the program's innovative features were a full-year teaching internship using a team-teaching model of student interns with master secondary teachers; a strong link between theory and practice; content-specific methodology; extensive use of journal writing, retreats, and other mechanisms designed to develop reflective practitioners; activities to promote strong cohort groups, peer coaching, and peer and program support (including a special Outward-Bound Program); a special modern language program which included teaching abroad; and a programmatic emphasis on alternative models of teaching and the teacher as a change agent.

New York State approved the undergraduate programs in September 1988 and the Master of Arts in Teaching (MAT) and combined-degree programs in January 1989. Certification areas included English, mathematics, modern and classic languages, the sciences, and social studies.

In June of 1989, the college enrolled its first class of thirty graduate MAT students and two undergraduates in the intensive eight-week summer phase of the program. As they graduated a year later, at the end of the period covered by this book, a new class of thirty-five graduate students and four undergraduates took their place and began their own intensive year of preparation as secondary school teachers.

See also: GRADUATE PROGRAMS.

—Janet McDonald

Edwards House. Built in 1949 as the KAPPA NU fraternity house, Edwards House, at 1247 Lenox Road, has been a college dormitory assigned to fraternities since 1971.

During the Second World War, Kappa Nu leased its building on Union Avenue to the government. When the members regrouped in 1947, they lived in the dormitories and prepared to build a house on campus. Because there was no longer any space for fraternities near the center, the fraternity was granted a site just north of the creek on the edge of the campus, and architect Leon M. Einhorn designed a rather plain, two-storey brick house quite different in style from existing Union fraternity houses. Construction, at a cost of about \$70,000, was begun in October 1948 and completed in September 1949; the house was dedicated October 22, 1949. Nine years later, Einhorn de-

signed a very similar house just to the north for Phi Sigma Delta, the other predominately Jewish fraternity then at Union (see HICKOK HOUSE).

Kappa Nu became PHI EPSILON PI in 1961, and disbanded in June 1970. During the next academic year, the house was operated as "1247," a club open to all. As that experiment seemed to have no future, the fraternity's alumni association, which owned the house, gave it to the College in October 1971, with the understanding that Union would establish a Kappa Nu Scholarship with a principal of \$10,000 plus the value of the furnishings.

Renaming the house for President JONATHAN EDWARDS, the College converted it to a dormitory. It has been occupied since the fall of 1977 by Theta Delta Chi.

Edwards, Jonathan (May 26, 1745–Aug. 1, 1801). Congregationalist minister, theologian, and second president of Union College.

Born in Northampton, Massachusetts, the ninth child and second son of eleven children of the illustrious theologian of the same name, Jonathan Edwards the Younger had an unusual childhood. When the boy was six, his father, dismissed from his Northampton parish, moved the family to Stockbridge, Massachusetts, where, as pastor of a small mission church, he worked among the Mohican Indians who constituted the great majority of the inhabitants. Most of Jonathan's classmates and playmates were Indians, and he became more fluent in their language than in English; even in later life he sometimes dreamed in Mohican.

Shortly before Jonathan's tenth birthday, his father, with the intention of preparing him to be a missionary, sent him to live among the Oneidas on the Susquehanna River, but instability caused by the French and Indian War forced the boy to return after five months.

Two years later, Edwards senior was chosen as the third president of the College of New Jersey (the future Princeton University). He died only three months after moving the family there in January 1858, and his widow died seven months later. With the help of family friends, the orphaned Jonathan entered the college at sixteen; his close college friends included DIRCK ROMEYN. At eighteen, following a revival, Jonathan was converted by the Rev. Samuel Finley and made a formal declaration of faith.

After graduation in 1765, he studied theology with the Rev. Joseph Bellamy, one of his father's chief disciples. Licensed to preach by the Association of Litchfield County, Connecticut in 1766, he began preaching as a candidate, but Princeton recalled him as a tutor of Language and Logic (1767–69). Declining the offer of a professorship, he then accepted a call to

the pastorate of the White Haven Congregationalist Church in New Haven.

It was a long but troubled tenure; the church had returned in 1760 to the practice called the Half-Way Covenant, which permitted baptism of infants whose parents were not in full communion. Edwards, opposed to the Half-Way Covenant, apparently made its abrogation a condition of accepting the congregation's pulpit; many parishioners, however, were never reconciled to that concession.

Edwards's mode of preaching exacerbated the problem; his sermons, often long discourses on theology, went over the heads of most of the congregation. A slender man of average height, dark of hair and complexion, with sharp, bold features and piercing eyes, he seldom looked at his audience, and he spoke rapidly in a nasal twang. Nor did his personality compensate for his deficiencies as a preacher: he lacked social graces, wit and small talk, and he struggled to subdue an irritable temper. Distant in manner and disposed to do only the necessary minimum of pastoral visiting, he seems to have practiced the advice he later gave a young minister: In Christian discipline, "you must set your face like a flint." Eight months after Edwards's arrival, some parishioners broke away to start a new church. Yet he endured, remaining pastor for twenty-six years.

In becoming a minister, Edwards was following his father, paternal grandfather, and four or five generations on his mother's side, but it is hard not to conclude that he should have broken with tradition and pursued an academic career. By the time he was twelve, he had read and reread Locke's *Essay on human understanding* with "constantly increasing delight," and throughout his life he was preoccupied with difficult problems in metaphysics and the philosophy of mind, almost to the exclusion of all else.

In those times, however, rigorous scholarship in a clergyman counted for a great deal, and between April 1781 and December 1794, Edwards filled the Yale College pulpit at least twenty-five times. He trained many future ministers, including ELIPHALET NOTT's brother Samuel, and he regularly assisted at Yale's public examinations, where he became legendary for strictness. Princeton awarded him a Doctor of Divinity degree in 1783, but when Yale's professorship of Divinity became vacant, he was passed over.

In his theological writings he was above all his father's disciple and defender, and he became a prominent exponent of the neo-Calvinistic movement known as "the New Divinity." His chief original contribution was the first full modern statement of the "governmental" theory of the atonement.

During his New Haven years, Edwards prepared for publication four volumes from his father's unpublished papers: *Sermons* (1780), *Practical sermons* (1788), *Miscellaneous observations on important theo-*

logical subjects (1793) and *Remarks on important theological controversies* (1794). He also published the first edition of his own *Observations on the language of the Muhhekaneew Indians* (1788) and *The salvation of all men strictly examined* (1790), a monograph critical of the doctrines of Dr. Charles Chauncy. Numerous sermons and articles by Edwards the Younger appeared in the *Theological Magazine*.

Soon after arriving in New Haven, Edwards married Sarah Porter in 1770; three of their four children survived him. Sarah was drowned in an accident in 1782, and the next year he married Mercy Sabin, who also survived him.

Edwards did not hold himself aloof from the public issues of his time. He preached in support of the American Revolution, and when, in the aftermath of the Battle of Lexington and Concord, a local militia company under the leadership of Benedict Arnold decided to defy the town meeting and march to Boston, Edwards blessed them; other clergymen, deferring to Loyalist sentiment in their congregations, remained aloof. He later lost a good deal of his property during the British raid on New Haven.

A passionate abolitionist, he wrote newspaper articles critical of slavery as early as 1773. A 1791 sermon, published as *The injustice and impolicy of the slave trade, and of the slavery of the Africans*, was reprinted four times, lastly in 1834. "Great Britain in her late attempt to enslave America," he wrote, "committed a very small crime indeed in comparison with the crime of those who enslave the Africans." That issue, at least, could undermine his flinty mien: when he later came to Schenectady as president of Union, he wept to see the unequal treatment of black and white parishioners taking communion at the Dutch Reformed Church.

Membership in the New Haven church slowly declined during Edwards's pastorate; finally, in 1795, the church requested his dismissal. The reason, President Stiles of Yale stated: "His Mode of Preaching & Rigidity in Church Discipline especially as to Terms of Communion & Baptisms, & his refusing to commune with the other two Congregational Churches in Town, with which that Church wish for free & open Communion." As soon as Edwards departed, the church reunited with the breakaway faction.

As his father had done after losing the Northampton church for similar reasons, Edwards then took a small mission church in a remote community for a couple of years before accepting the offer of a college presidency. While pastor of the Congregationalist church at North Colebrook, Connecticut, he completed *A dissertation concerning liberty and necessity* (1797), a defense of his father's position against the criticisms of Dr. Samuel West and others.

Seeking to replace its first president, JOHN BLAIR SMITH, Union College in 1799 offered the position successively to PETER WILSON and William Linn, who

both declined, and then, in a May 1 vote that was not unanimous, to Edwards, who accepted.

Edwards had passed through Schenectady as a child en route to the Susquehanna in 1755, but there is no record that he had ever seen Union College before being offered its presidency. There had been several points of contact, however: his elder brother, the Rev. Timothy Edwards, had been named in 1780 by Governor Clinton as a prospective member of the Board of Trustees of the proposed college; also, Jonathan seems to have known trustee Eliphalet Nott very well, and he had been a close friend of trustee Dirck Romeyn when they were Princeton undergraduates. Finally, Edwards' nephew, Yale president Timothy Dwight, had visited Union the previous year and noted the progress on Stone College.

The old SCHENECTADY ACADEMY building, which still housed the College, was illuminated the night of Edwards' arrival in late July 1799. The four-year-old institution had a faculty of only two men—ANDREW YATES and JOHN TAYLOR. CORNELIUS VAN DEN HEUVEL had died in April, and his replacement, BENJAMIN ALLEN, would not be hired for over a year. The institution's greatest need was funds to complete Stone College (see WEST COLLEGE (OLD)).

Edwards successfully lobbied the state legislature for contributions, but they were insufficient to complete the building. Internally, he concerned himself with the moral and intellectual life of students. Under his leadership, the faculty extended required attendance at morning and evening prayers from weekdays only to a full seven days, and added Saturday morning classes to the schedule. (To spend all of Saturday "in relaxation from business" was deemed "an unnecessary waste of time" by the Edwards administration.) In response to a trustees' resolution passed a few months before Edwards' arrival, the new president added to the curriculum a weekly class in English that focused on writing and public speaking. In the spring of 1800, presumably on Edwards' recommendation, the rules against playing billiards or gambling were strengthened, and keeping wine or spirituous liquors in rooms was forbidden. To permit more thorough examinations, the spring examination period was extended from three days to four.

Although Edwards tightened discipline, he was apparently less severe than those who knew him expected, and one alumnus later recollected another side of the man: according to Thomas Palmer '03, the president sometimes laughed so immoderately in his philosophy classroom that he was obliged to dismiss the class.

Edwards faced one serious crisis during his short tenure: in the wake of several discipline cases, students presented two petitions to the September 1800 trustees' meeting. One, signed by a majority of the student body, called for the removal of Professor Andrew

Yates, charging him with "being partial," "assuming too much authority," and showing "a want of general knowledge." The other petition, from the junior class, asked the trustees to fire Benjamin Allen, whom they regarded as an incompetent teacher. When the trustees rejected the petitions and rebuked the petitioners, the situation became quite volatile; some students quit and enough others threatened to do so that the future of the College was thought by some observers to lie in the balance. Edwards succeeded in calming the students, however, and the crisis passed.

Edwards' time at Union was perhaps more consequential for his church than for the College. Raised a Congregationalist, he had spent his formative years in Princeton among Presbyterians. Although he then pursued a career as a Congregationalist clergyman in Connecticut, it is the judgment of church historian Robert Ferm that Edwards, "perhaps more than any other New England figure, devoted himself to rapprochement between the two main branches of the American Reformed tradition."

At Union, Edwards was again among Presbyterians. Sent by the General Assembly of the Presbyterian Church as a delegate to the 1800 General Association of Connecticut, he advocated closer cooperation between the two churches and chaired a joint committee to settle a working arrangement for church-building on the expanding western frontier. Edwards, who had started Congregationalist churches in the western New York towns of Clinton, New Hartford and Paris in 1791, had a major responsibility for the precise formulation of the "Plan of Union" of 1801, which effectively ceded the territory west of New England to the Presbyterians. Although John Blair Smith and Eliphalet Nott were also advocates of this plan, their role in bringing it about was apparently less important than Nott's writings suggest.

The parallels between the lives of Edwards and his famous father have interested "Believe it or Not" Ripley and others of like mind, not least because both father and son began their final year by preaching on *Jeremiah 28:16*: "This year thou shalt die." On the second anniversary of his arrival at Union, President Edwards fell ill of an "intermitting fever of the regular type"; he died a few days later, and is buried in the cemetery of Schenectady's First Presbyterian Church.

Electrical Engineering Department. The electrical industry and the electrical engineering profession could both be said to have originated in the 1876 Centennial Exposition at Philadelphia, where Alexander Graham Bell demonstrated his telephone, Zenobe Gramme his electric dynamo, and Thomas Edison his quadruplex telegraph. In a sense, electrical engineering at Union also stemmed from that event.

Inspired by the exposition, Philadelphia teachers Elihu Thomson and Edwin J. Houston founded an

electrical manufacturing company in 1883 which later merged with Schenectady's Edison General Electric Co. In 1893 CHARLES PROTEUS STEINMETZ and ERNST JULIUS BERG moved from the firm's Lynn, Massachusetts, plant to Schenectady. Between them they would run Union's Electrical Engineering Department for thirty-eight years.

Curricula in electrical engineering can be traced back to 1882 when MIT's physics department offered an alternative course for students wishing to enter any of the branches of electrical engineering. The University of Missouri formed the first electrical engineering department in 1886.

When ANDREW VAN VRANKEN RAYMOND took office as Union's president in May 1894, the College was in very weak condition, with enrollments, morale, reputation and financial prospects all lower than they had been in the mid-nineteenth century. Looking for a program to lead Union's recovery, Raymond quickly concluded that the proximity of General Electric, the increasing national need for electrical engineers, and Union's tradition of engineering made that field a good choice. The College announced in 1894 an electrical engineering option to the civil engineering program. Since all the electrical engineering courses would fall in the senior year, no new faculty was needed until 1897, when Dr. Byron B. Brackett was hired as Union's first instructor in electrical engineering. He was assisted by twelve occasional lecturers from General Electric, including Steinmetz. The first seven students graduated in 1898 (the regular civil engineering course graduated only two students that year).

Horace T. Eddy replaced Brackett as Instructor in Electrical Engineering in 1898 and advanced to assistant professor in 1901. When he left in 1902, Clarence J. Coley and R. Neil Williams were hired as instructors.

Ten students had graduated in 1899, but enrollments then fell off, and the next five years produced from two to four graduates each. If the program was to play the role in Union's fortunes that Raymond had hoped, dramatic changes were necessary. In January 1901 the Board of Trustees appointed a committee to "secure legislation looking to the establishment of a State Electrical Laboratory at the College." An act introduced in the legislature the following month would have appropriated \$150,000 for a building and \$25,000 a year for salaries and other expenses. The College would have committed itself to providing full four-year scholarships to twenty-five students in each entering class, distributed by legislative district. The legislature held hearings later that year (with RPI registering its opposition), but although the proposal was still alive in 1903, it ultimately came to nothing.

R. Neil Williams, a GE engineer educated in Germany, wrote to Raymond in August 1902, shortly after his appointment to the Union faculty, pressing the president to reorganize the existing "superficial"

electrical engineering course. At the same time he transmitted an offer from Steinmetz to give, at no charge, a weekly lecture on "Modern Theory of Alternating Currents" to the senior class, provided the course were reorganized and the senior class numbered at least ten students.

Steinmetz had by then achieved international fame for his work on hysteresis and alternating-current circuits. Harvard University awarded him an honorary masters degree in June 1902, and he was increasingly interested in education. In the fall of that year, he accepted President Raymond's invitation to head a separate electrical engineering department at Union. To regularize his status as Professor of Electrical Engineering, Union awarded him an honorary PhD in June 1903, and Steinmetz took charge that fall. General Electric continued to pay his full salary, and Steinmetz continued to spend much of his time on GE work, with Williams and later Elmer Creighton handling much of the routine of the chairmanship. Steinmetz' service to Union is described in more detail in the article under his name.

General Electric also contributed money and equipment for laboratories. The department was housed in North Colonnade until the company underwrote construction of an electrical engineering laboratory building in 1905-7 (see BIOLOGY BUILDING). GE made no curricular demands on the undergraduate program, but it did expect the College to offer a master's degree program for its employees. The first master's degrees were awarded in 1905.

Until 1902/03, all the courses specific to electrical engineering in the undergraduate program were given in the senior year: d-c machines, a-c circuits and machinery, transmission lines, and electric railways and lighting. There were no separate courses on the telephone or telegraph, though these subjects may have been included in "Modern Theory of Electrical Engineering," added in 1902/03.

Steinmetz was assisted each year by three other faculty members. He headed the department until 1913, lectured occasionally for a few additional years, and lent the College the prestige of his name by remaining nominally on the faculty, as Professor of Electro-Physics, until his death in 1923.

He was succeeded as chairman by Ernst J. Berg, who had spent the preceding four years chairing the University of Illinois electrical engineering department. GE covered more than half of Berg's Union salary, in return for which he served as a Consulting Engineer to the company from 1913 to 1931. He also greatly expanded the master's program at the College and nurtured the doctoral program which had begun in 1910 but produced its first PhD in 1917. One hundred twenty-eight master's degrees and eight doctor's degrees were awarded in Berg's twenty-eight-year

tenure as department head. These were Union's first graduate programs.

Berg introduced courses in radio and telephony, and was one of two men in the country who taught Heaviside's operational calculus, the forerunner of the Laplace transform.

Notable faculty in the Steinmetz-Berg era were MORLAND KING (1906–20), who went on to head the electrical engineering department at Lafayette, Walter Lyman Upson (1912–20), who subsequently chaired the electrical engineering department at Washington University in St. Louis, JOHN NICHOLAS VROOMAN VEDDER (1914–36), FREDERICK WARREN GROVER (1920–46), and Sylvester Jacob Haefner (1925–42), who left during the Second World War to become chief civilian scientist at the Naval Underwater Sound Laboratory in New London, Connecticut.

Soon after assuming the chairmanship, Berg moved the faculty offices and classrooms to the Electrical Engineering Building, which until then had served as a laboratory only. By 1930, that building was too small, and FRANK BAILEY indirectly paid for a new one immediately to the east, which opened in 1930 (see STEINMETZ HALL).

One innovation of Berg's time harked back to the Centennial Exhibition of 1895. In 1915 the department hosted the first of what were intended to be annual Electrical Shows, featuring "electrical freaks" such as "an incandescent lamp lighted under water with no connecting wires," a four-room flat equipped with the most modern appliances, and telephone and wireless exhibits. Visitors to the exhibits in the labs and the basement of Washburn Hall included "many high school students and scientific men from this part of the state." The First World War prevented another show until 1919, and the 1920 event was the last.

In the early years, the department attracted nearly all the foreign students attending Union, 122 of them in the period 1910–25.

When Berg retired in 1941, Grover served for a year as chairman before his own retirement, and Harold Whitney Bibber, a professor at Ohio State University who had earlier worked for GE, was then appointed head of the department and chairman of the engineering division. Because Bibber's specialty was in machinery, the curriculum did not change much until after the Second World War. Heaviside's operational calculus had disappeared from the curriculum with Berg's retirement (a similar course using the Laplace transform appeared in 1957).

Although radio had been around for over thirty years, and television for fifteen, no electronics courses appeared in the curriculum until 1946. Courses in electromagnetic engineering were taught by part-time lecturers from General Electric, notably Simon Ramo (1942–45) and John R. Whinnery (1945–46). Ramo went on to found the Ramo-Wooldridge Company

(later TRW). Whinnery subsequently became dean of engineering at the University of California at Berkeley. Thomas Ripton Hoffman '45 introduced electronics courses as such, teaching them in the period 1946–50, and later in 1954–79. Bibber hired WALTER WALLACE LEWIS (1946–52, 1955/56), a world authority on the effects of lightning on transmission lines, who had just retired from GE. In 1947 Bibber convinced a former graduate student of his at Ohio State, Clarence Francis Goodheart, to join the faculty. Richard Baldwin Russ (1941–42, 1948–83), who had been on loan for one year from General Electric during the war, rejoined the faculty in 1948.

Goodheart (1947–81) succeeded Bibber as department chairman in 1955. He hired Edward Joseph Craig '45 (1956–92) in 1956.

In 1959 Hoffman introduced the first course in digital computers; it emphasized logic design and machine and assembly language programming. He convinced the Board of Trustees to rent an IBM 1620 digital computer which was installed in December 1962. The computer science program grew rapidly from then on, helped by Charles Alton Plesums '65 (1965–69), who followed Hoffman as director of the COMPUTER CENTER, and by THEODORE GEORGE SCHWARZ MS '59 (1965–87), who succeeded Plesums.

As far as this writer can ascertain, the department's dealings with the College administration from its beginnings until 1964 had been good. There is some indication that, in the last few years of Berg's tenure, he was not on good terms with President Dixon Ryan Fox, but the nature of their disagreement is unknown. More serious problems with the administration began when President CARTER DAVIDSON announced his retirement in 1964 and Theodore Lockwood came on the scene as Provost, with the understanding that the Board of Trustees expected to see major curricular reforms and a new calendar. The resulting changes, in this writer's view, almost destroyed the engineering programs. If it had not been for the 1985 review by the Accreditation Board for Engineering and Technology (ABET), our programs would not have survived.

During the five-month interregnum between Davidson's departure and President Martin's arrival, Provost Lockwood persuaded a sometimes reluctant faculty to change its calendar to a trimester model and to reduce the courses required for graduation from forty to thirty-six, while introducing a "Comprehensive Education" curriculum. Moreover, credit hours were abandoned; courses which required students to spend long periods in laboratories received the same credit as those taught entirely in the classroom.

As a result of the ten percent cutback in courses, the electrical engineering curriculum lost two courses in mathematics, two in physics, the courses in electromagnetics, economics, heat engines, strength of materials, graphics, and high frequency electronics. Added